

WHAT IS CLAIMED IS:

1. A method for molding composite items, made of beads of sintered expanded resin and inserts, comprising the steps of:

5 providing a movable half-mold and first and second half-molds which are movable by translational motion at right angles to a direction of motion of said movable half-mold;

10 performing a molding operation by way of a first one of said translatable half-molds mated with said movable half-mold, translating said translatable first half-mold from a position for accessing said half-mold to a molding position, simultaneously accessing a second one of said translatable half-molds when the first one of said translatable half-molds is located at the region for access to said translatable half-mold.

15 2. The method of claim 1, further comprising the steps of:

manually placing said inserts in the first one of said translatable half-molds;

15 performing translational motion of said first translatable half-mold from said position for access to the first translatable half-mold to said molding position;

20 moving said movable half-mold so as to close against said first translatable half-mold in order to perform the molding step;

manually placing said inserts in said second translatable half-mold;

opening said movable half-mold and performing the translational motion of said first translatable half-mold to a second position for access to said half-mold, simultaneously placing said second half-mold at said molding position;

25 closing said movable half-mold against said second translatable half-mold and starting the molding step;

30 unloading said first translatable half-mold simultaneously with the molding step performed between said movable half-mold and said second translatable half-mold; and

loading with said inserts said first translatable half-mold and repeating the cycle.

3. The method of claim 2, wherein said step of unloading said translatable half-molds is performed in any of a manual and mechanical 5 manner with aid of mechanical extractors.

4. The method of claim 2, comprising the step of supplying said translatable half-molds with hoppers and injectors, respectively.

5. The method of claim 2, comprising the step of providing said inserts made of plastic material which has a chemical affinity with said sintered 10 expanded resin beads.

6. The method of claim 2, comprising the steps of: providing said inserts made of a material having, distributed on a side thereof arrangeable to make contact with said expanded resin beads, a primer which allows to bond the material with said expanded resin beads; and providing heat and mechanical 15 pressure for bonding the material to said expanded resin beads.

7. The method of claim 2, comprising the steps of: providing said inserts made of any material; and bonding said material with said expanded resin beads by partial immersion thereof in said expanded resin beads.

8. The method of claim 2, comprising the steps of providing said inserts 20 made of sintered expanded resin beads which have a chemically affinity with said sintered expanded resin beads.

9. The method of claim 1, comprising the steps of:
closing said movable half-mold against said translatable half-mold;
starting from a configuration in which the first one of said translatable 25 half-molds is at one of the two positions for accessing the half-mold and the second one of said translatable half-molds is at said molding position;
sintering said expanded resin;
opening said movable half-mold and performing translational motion of said translatable half-mold to the manual access position and of said second 30 translatable half-mold to said molding position;

closing said movable half-mold and performing a sintering step;
simultaneously with said sintering step of said second translatable half-mold, manually assembling said inserts on said first translatable half-mold;
opening said movable half-mold and performing the translational motion
5 of said first half-mold to the molding position and of said second half-mold
to the manual access position;
closing said movable half-mold with said first translatable half-mold and
bonding said inserts with said sintered expanded resin;
simultaneously with the bonding of said inserts, assembling said inserts
10 on said second translatable half-mold;
opening said movable half-mold and performing the translational motion
of said first translatable half-mold to said manual access position and of said
second translatable half-mold to said molding position;
closing said movable half-mold against said second translatable half-mold
15 and beginning the bonding of said inserts;
simultaneously with said bonding performed in said second translatable
half-mold, unloading the finished part from said first translatable half-mold;
opening said movable half-mold and performing the translational motion
of said first movable half-mold, once unloaded, to said molding position and
20 of said second translatable half-mold to said manual access position;
repeating the cycle.

10. The method of claim 9, wherein said inserts are made of a plastic
material which has chemical affinity with said expanded resin beads.

11. The method of claim 9, wherein said inserts are provided made of
25 different materials and comprise a primer, which is distributed on a side
thereof arranged to make contact with said expanded resin for bonding
thereof with said expanded resin.

12. The method of claim 9, wherein said inserts are constituted by
sintered expanded beads which have chemical affinity with said expanded
30 resin beads.

13. An apparatus for molding composite items, made of sintered expanded resin beads and of rigid or flexible inserts, comprising:
a movable half-mold;
a first translatable half-mold and a second translatable half-mold;
said movable half-mold being movable between a position for closure with one of said first and second translatable half-molds and an open position, said one of said translatable half-molds being able to perform a translational motion at right angles to a movement of said movable half-mold, so that alternatively one of said first and second translatable half-molds is in a molding position for being mated with said movable half-mold in order to perform said molding, and the other one of said first and second translatable half-molds is in a manual access position, allowing access thereto to an operator, simultaneously with molding performed with the translatable half-mold that mates with the movable half-mold.

14. The apparatus of claim 13, further comprising a translatable platform provided to rigidly support said two translatable half-molds.

15. The apparatus of claim 13, comprising, provided at each one of said two translatable half-molds, a hopper and injectors for feeding said resin beads.

16. The apparatus of claim 13, comprising, provided at each one of said translatable half-molds and said movable half-molds, a hopper and injectors for feeding said resin beads.

17. The apparatus of claim 13, further comprising a protection area delimited by barriers which are interrupted at said manual access positions in order to allow operators to access said protection area.

18. The apparatus of claim 13, comprising sensors adapted to detect presence of operators at said manual access positions.

19. A helmet for cycling and skiing, manufactured through the method as claimed in claim 1.

20. A helmet for cycling and skiing made with an apparatus according to

claim 13.

21. The method of claim 1, wherein said expanded resin beads are chosen from a group comprising: expanded polystyrene, expanded polypropylene, expanded polyethylene, or a copolymer whose base is said
5 polystyrene, polypropylene and polyethylene.